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mal, immediately upon its occurrence. The first fruit of this excellent system, in the form of a highly interesting shark, arrived at the Smithsonian Institution on the 14th inst., from Amagansett, Long Island. To indicate the importance which this new departure seems likely at once to assume, it may be stated that this first specimen, having been examined by Dr. T. H. Bean, curator of the department of fishes, proves to be a species of *Pseudotriacis*, a genus of which no representative has been hitherto recorded as occurring in the western Atlantic. The species, *P. microdon*, to which the Amagansett shark belongs, was made known in 1867, by Capello, from the coast of Portugal.

Bureau of Ethnology.

Cliff dwellings in the Cañon de Chilly.—The ethnologic and archeologic researches that were begun a few years ago in the north-west were continued during the present season in that region known as the San Juan, principally in the cañons formed by the drainage of that river and its tributaries. The examinations of ruins were conducted in Cañon de Chilly and some of its principal side cañons, by Col. James Stevenson; and some important and interesting discoveries and collections were made. About forty-five ruined villages and dwellings were visited, many of which were carefully explored. Several of the more important villages were surveyed, and careful measurements taken, from which to construct models. About one-fourth of the number of ruins observed in these cañons were situated so high up in the sides of the cliff walls as to be inaccessible. Those, however, from which the finest specimens were obtained, and which presented the most novel features of architecture, were reached. One village, in this connection, is worthy of special mention. It is located in a side cañon of the de Chilly, about twelve miles from its junction with the main valley. The ruins occupy a space of about 900 feet in length by an average width of 125 feet. It is located in a large cave-like opening, whose arch circles over the village to a height of about 200 feet. Some of the houses have tumbled completely down; others are in a partial state of preservation; and a few are so well preserved as to present the whole plan of architectural design, as well as all the details of the masonry. This dwelling showed, that, wherever implements were used in its construction, they were made of stone; and no evidence appeared that the inhabitants had any knowledge of metal. The implements were all either of bone, stone, or wood.

At intervals among the ruins stood the walls of four estufas, in a sufficient state of preservation to enable one to define very closely the character of the original structure. These were circular, but varied quite essentially from estufas of the present day. The interior of one of these has a wide band, laid on in bright, durable colors, running entirely around the structure, resembling a Greek fret, with narrow bands above and below, and with the interior spaces filled with curious artistic designs. The walls in the rear of the ruins are literally covered with picture-writing, and in every convenient spot may be seen small cup-like cavities produced by sharpening stone implements.

In front of the village was found a burial cist, or artificially constructed oven-shaped pen, in which were found the remains of four human skeletons. The manner and care manifested in the burial of these dead may be taken as a type of the burial-customs of the cliff-dwellers. This cist, or oven, was composed of small logs, stones, and plaster. The diameter of the urn at the bottom is about four feet, closing toward

the top in the shape of a dome. The logs were laid one on the top of the other, earth thrown up around the outside, and the interior heavily coated with plaster. The skeletons were doubled up like mummies, though buried without being wrapped in cloth or clothing of any kind. These skeletons were secured, and brought to the National museum. Among the débris of these same ruins were found many objects of dress and clothing, several kinds of moccasons or sandals, showing fine workmanship and skill in weaving, and many other objects illustrative of the art, manners, and customs of the cliff-dwellers; a full account of which will appear in Major Powell's official report from the bureau.

PUBLIC AND PRIVATE INSTITUTIONS.

Harvard college observatory.

Transmission of astronomical intelligence.—An association of about fifty European observatories has recently been formed for this purpose, with its headquarters at the Royal observatory, Kiel, Germany, directed by Prof. Krueger, who has taken charge of the business of the association. Connections by cable have been established with South America, South Africa, and Australia; and the observatory has been requested to co-operate with it, in the United States, by receiving and distributing in this country the telegraphic information sent from Kiel, and by forwarding to Kiel by telegraph any similar information of importance collected from American astronomers. By the courtesy of Prof. Baird, secretary of the Smithsonian institution, the function hitherto performed by the institution, of collecting and transmitting announcements of discovery, has been transferred to the Harvard college observatory.

The importance of the work thus begun requires that a special officer of the observatory should be intrusted with it. Mr. John Ritchie, jun., has accordingly been appointed assistant in charge of this service, and the details of the proposed system are explained by him in a circular, which may be had on application.

American astronomers are requested to send to the "Harvard college observatory, Cambridge, Massachusetts," telegraphic information of discoveries of comets, asteroids, or phenomena of any kind requiring immediate attention. Arrangements will be made to refund the cost of such telegrams to the senders when their contents are of importance. It is very desirable that the messages should conform to the principles stated in Mr. Ritchie's circular.

It is intended that the distribution of information in this country shall be of such nature as to be productive of the greatest possible benefit, and will be of the broadest possible character. Discoveries, whether by American astronomers or by foreigners, will be circulated through the associated news companies, by special circulars of the *Science observer*, and by special telegrams.

NOTES AND NEWS.

—The National academy of sciences at its last meeting appointed a committee, of which Prof. C. A. Young is chairman, and Prof. J. H. C. Coffin secretary, to arrange plans for observing the total eclipse of the sun of May 6 next. This eclipse is of unusual importance, as the duration of totality at its maximum value is 5 m. 55 sec. Unfortunately, the path of the shadow lies wholly in the Pacific Ocean, and

there are only a few small islands from which observations are possible. Mr. C. H. Rockwell, at the recent meeting of the American association, suggested the feasibility of sending an expedition to Caroline Island, which is situated in latitude 10° south, and longitude 150° west; and his plan has been adopted by the committee. A small appropriation of \$5,000 was asked from Congress to defray the necessary expenses, and forms one of the items in the sundry civil bill now under consideration, with little doubt of its being granted.

The expedition leaves New York to-day by steamer for Callao, *via* Panama. At this point, through the courtesy of the secretary of the navy, a man-of-war receives the party, and conveys them to Caroline Island. This is a small coral island, and said to be inhabited by a few persons. It is near the central line, and will give the observers a period of about five minutes, or a few seconds more, of the total phase.

The members of the party are as follows: Prof. E. S. Holden of Madison, Wis.; Mr. C. H. Rockwell of Tarrytown, N.Y.; Prof. C. S. Hastings of Baltimore; Mr. E. D. Preston, U.S. coast-survey; Mr. W. Upton, U.S. signal-office; and Ensign Brown, U.S. navy. The party will be further increased by two English astronomers sent by the Royal society, who will join the expedition at Panama.

The most important observations planned are a search for intra-mercurial planets, spectroscopic observations, and photographic work. The last named is wholly in the hands of the English guests of the party. Professor Hastings has planned the spectroscopic work, and will use a 6 $\frac{1}{4}$ -inch, a 4 $\frac{1}{10}$ -inch, and a 2 $\frac{1}{2}$ -inch telescope. The first named is fitted with a grating for examination of the chromosphere before and after totality, and with a large prism for special study during the total phase of the outer corona. The second is provided with a grating, and also a single prism, and is designed for use in studying the relative lengths of lines reversed just before totality, and the limits to which the line 1474 K can be traced. The smallest instrument has a 30° prism of flint-glass placed before its objective, and is designed for observing the relative heights and brightness of the rings H _{α} , H _{β} , H _{γ} , H _{δ} , D₃, and 1474 K.

The instrumental outfit includes, in addition, a 6-inch telescope, a 4-inch and a 2 $\frac{1}{2}$ -inch polariscope apparatus, and meteorological instruments for studying radiation and other phenomena.

It is probable that the expedition will arrive at Caroline Island the latter part of April. After the eclipse the naval vessel will sail for Honolulu, from which the party will return *via* San Francisco. The Coast-survey observer carries a pendulum, which will be swung at various points as occasion offers. The chances of fair weather are very good, and the outlook for the success of the expedition seems in every way to be favorable. It is not known that any other

expedition will be sent to observe the eclipse; though a French expedition to observe at Flint Island, which is near Caroline Island, has been planned.

— The American members of the International congress of electricians, which assembled in Paris in 1881, were: Hon. Levi P. Morton (American minister), Prof. G. F. Barker of Philadelphia, Major D. P. Heap, U.S.A., Dr. Cornelius Herz, Lieut. T. C. Maclean, U.S.N., and Prof. Henry A. Rowland of Baltimore.

The members chosen by the U. S. government to represent them at the Electrical conference, held in October, 1882,—of which an account is given in our leading article,—were Prof. Henry A. Rowland of Baltimore, and Prof. John Trowbridge of Cambridge.

— Not a few of our younger scientific men will feel a personal loss in the recent death of Hon. Paul A. Chadbourne, president of the Massachusetts agricultural college. Previously president of the University of Wisconsin and of Williams college, earlier professor at the latter institution and at Bowdoin college, an instructor in chemistry, *materia medica*, geology, botany, zoölogy, and natural theology, he has been brought all his life into contact with young men, and has impressed them with his earnestness. Occupied in too many and too varied pursuits to give his strength to research, but possessed of native powers and intuitive perceptions which would have enabled him to accomplish much in such a field, he has yet encouraged so many young men in the beginning of their career,—men who to-day hold their own in American science,—that his name deserves honorable mention here. He was a man of intense activity and diversified talents; being perhaps equally known as preacher, legislator, lecturer, and manufacturer, but best of all as an instructor. He died in his sixtieth year.

— A course of seven free Saturday-night lectures at the Cooper Union, New York, commencing Feb. 17, is announced as follows: Miss L. Von Finkelstein, on Domestic and city life in Jerusalem; Rev. J. C. Eccleston, D.D., on Columbus and his companions; Dr. Samuel Kneeland, on the Sandwich Islands, the land of fire; the same lecturer, on Iceland, the land of desolation; Prof. H. L. Fairchild, on Animal self-defence; the same lecturer, on Prehistoric man; the last of the course by J. H. Wilson, Esq., on Spain. All the lectures will be illustrated.

— At a meeting of the American philosophical society held at Philadelphia on Feb. 21, the subject of glacial motion was treated by Professors Lewis, Frazer, and Lesley; Prof. Lewis discussing the various causes assigned for the extension and southward flow of the great glacier, Prof. Frazer recounting the observations of Messrs. Peach and Horne on the glaciation of Scotland, and Prof. Lesley giving an amusing description of the rival theories of British glaciation urged by different geologists.

— Prof. C. S. Sargent of Harvard university has in preparation a new North-American *Sylva*. The drawings will be made by Mr. Charles E. Faxon, and the work will be published by the U. S. government.

— The latest numbers of the *zeitschrift* of the Berlin Gesellschaft für erdkunde (h. 4 and 5, xvii. 1882) contain papers on Russian surveys in 1881, by Lademann; Haussknecht's travels in Asia Minor and Persia, by H. Kiepert; on some Branches of the Amazon, translated from the Portuguese by W. Reiss, with a map showing the great irregularity of the channel between long. 55° and 60° W. Gr., and its frequent expansion into lakes.

— One of the tables at the zoölogical station at Naples is occupied the present season, by appointment of the University of Cambridge, Engl., by an American, Miss Emily A. Nunn, formerly professor of biology at Wellesley college, Wellesley, Mass.

— The *Boletim da sociedade de geographia de Lisboa*, 1882, No. 5, contains continued articles on the Portuguese possessions in eastern Africa, translated from O'Neill's observations, on Portuguese colonies (No. xx., in Belgium), and on the island of St. Nicholas (Cape Verde); and the results of meteorological observations in Loanda, 1879-81, by Coelho, from which we note the following factors. The barometric pressure (at an altitude of 59 met.) has its maximum of 759 mm. in July or August, and minimum 755 in January or February; the daily variation is 2.7 mm. The temperature averages 23° C., varying from 19° in July or August to 25° or 26° in February, with an average daily range of from four to eight degrees; the absolute maximum is $31^{\circ}.7$, and absolute minimum, $13^{\circ}.5$. The relative humidity averages 82, and rarely falls below 70. The west wind is much more frequent than any other, and seems to bring two seasons of rain, one about December, and a greater one about April; but in the three years of observation the results are very variable, 1879 giving a total rain of 571 mm., and 1881 having only 134. From May to October inclusive, very little rain falls; and June, July, and August are practically rainless. Evaporation carries off about 1.9 met. of water a year, and cloudiness averages five in a maximum of ten.

— During the last tourist-season in the Alps, fourteen persons were injured in mountain-climbing, three of them fatally. Bohren of Grindelwald was struck by lightning on the Wetterhorn, and instantly killed. Notary v. Hütte of Bern, in attempting an ascent of the Wilde Frau, had lowered a companion by a rope over a steep wall some fifteen feet high; but was severely hurt in jumping after him, and died from his injuries. A son of Surgeon Wahli of Bern fell on the Niesen, while picking *alpenrosen*, and was dead when found.

— In October of last year, a society was organized

in Ottawa, Canada, called the 'Ottawa microscopical society,' with J. F. Whiteaves, Esq., F. G. S., as president, and J. B. Tyrrell, B.A., as secretary and treasurer. During the winter papers have been read and illustrated on the following subjects: Deep-sea soundings; Microscopic structure of rocks; Some insect parasites; Diatoms; and Human cellular tissue. The summer will be given to collecting, and next winter the society hopes to have a large amount of material for study.

— An ingenious device for stirring up sluggish fish, as a preliminary to catching them through the ice, is mentioned by Lansdell in his recent book of travels, *Through Siberia*, as being employed by the natives on the river Irtish. The process is there specially applied to the capture of sturgeon, which in winter congregate in muddy hollows in the bed of the river, where they lie motionless for the sake of the warmth. The fishermen cut holes in the ice, and set spring-lines at them, and then proceed to heat a number of balls of clay red hot, and to throw them into the river below the bait. The heat rouses the fish, which rise, swim up the stream, and are caught. It would be of interest to determine by experiment whether any of our own food-fishes could be induced to take bait by inciting them to activity by means of heated bricks.

— The Acadian science club has been formed in Nova Scotia for the encouragement of home study. The 'Acadian scientist,' published at Wolfville, N.S., is its official organ.

— There seems to be a common impression that the nickel five-cent piece was intended to weigh five grammes and to measure two centimetres. The coinage of 5-cent nickel coins (nickel and copper alloy) was authorized by an act of Congress May 16, 1866, and was begun during that fiscal year. The act left the shape and devices upon the coin to the discretion of the director of the mint, subject to the approval of the secretary of the treasury. The weight of the coin was fixed at 67.16 grains, or 4.352 milligrammes, with a margin of 2 grains or 125 milligrammes each way to allow for accidents of coinage. Three five-cent nickels of the date 1866 were found to weigh 4.828, 4.869, and 4.920 grammes respectively. Two of the date 1872 weighed 4.906 and 4.982. Seven coins of different dates measured twenty and one-half millimetres within one-tenth of one millimetre.

Evidently there was no intention to make the coin two centimetres in diameter, nor to have it weigh either four grammes or five. It may be remarked that all the coins are above the legal limit of weight (4.48 grammes).

— The National convention of agriculturists held at the U. S. department of agriculture the last week of January called together delegates from nearly every state in the union. The first and second sessions (Jan. 23 and 24) were devoted to a discussion of

agricultural colleges and societies, and of the general subject of agricultural education. Papers were read by Dr. O. C. Abbott of Michigan, Mr. Augustine Smith, Hon. Jno. A. King, Prof. J. A. Holmes of North Carolina, and Hon. D. W. Aiken of South Carolina.

Animal industries were discussed on Jan. 25, 26, and 27; and papers were presented by Mr. R. Baker of Ohio, Dr. James Law of New York, Mr. R. V. Gaines of Virginia, Mr. T. D. Curtis of New York, Mr. H. B. Guiler of Illinois, Mr. Ezra Stetson of Illinois, Prof. Wesley Webb of Delaware, and Dr. M. G. Ellzey of Virginia. Much interest was manifested in both of these sessions, and the general discussions were animated and interesting. On the 29th, the last day, and the one set apart for the consideration of the cotton industries, there was a decided falling-off in attendance; many of the delegates having left for home Saturday night, the 27th.

These conventions which Dr. Loring has called together, and which he inaugurated a year ago, have been productive of much good in bringing representative agriculturists into closer relations with the department. They indicate the desire of the commissioner to study the wishes and opinions of the people in the management of the department, and thus to increase its usefulness.

—Advices received from the U. S. consul at Montevideo, through the Department of state, show an alarming condition of affairs in parts of Uruguay from the ravages of destructive locusts. Foreign countries frequently apply through the state department for copies of the two reports of the U. S. entomological commission on the Rocky-Mountain locust; and it may be well to announce that they were published under the interior department, and are both out of print. The agricultural report for 1877 contains a condensed account of the more practical chapters by Professor Riley, and this may yet be obtained of the commissioner.

—The agricultural committee of the house has agreed to report favorably a bill introduced by Mr. Anderson of Kansas, which empowers the President to appoint nine commissioners whose duty it shall be to investigate thoroughly the movements of agricultural products from points of production to their final markets, the actual cost to the common carrier and his profits, and all matters which practically affect the difference between the prices received by the producer and those paid by the consumer.

—In Salusbury's translation (p. 79) of Dialogue first of Galileo on 'His Systeme of the World,' 1661, Sagredus is made to say, "You put me in mind of a man, who would have sold me a secret how to correspond, by means of a certain sympathy of magnetick needles, with one that should be two or three thousand miles distant; and I telling him, that I would willingly buy the same, but that I desired first to see

the experiment thereof, and that it did suffice me to make it, I being in one chamber, and he in the next, he answered me that in so small a distance one could not so well perceive the operation; whereupon I turned him going, telling him that I had no mind at that time to take a journey unto Grand Cairo, or to Muscovy, but that if he would go himself, I would perform the other part, staying in Venice."

RECENT BOOKS AND PAMPHLETS.

Amateur mechanics: an illustrated monthly magazine; conducted by Paul N. Hasluck. Part i. London, *Trübner*, 1883. 32 pl. 8°.

Amos, S. The science of politics. London, *Paul*, 1883 (Intern. sc. series). 496 p. 8°.

Bell, Alexander Graham. Upon the electrical experiments to determine the location of the bullet in the body of the late President Garfield; and upon a successful form of induction balance for the painless detection of metallic masses in the human body. Wash., *Gibson pr.*, 1882. 58 p. 8°.

Boase, H. S. A few words on evolution and creation. London, *Leng*, 1883. 276 p. 8°.

Buffalo — Naturalist's field club. Bulletin. Vol. i. nos. 1-2. Buffalo, *Hicks pr.*, 1883. 48 p. 8°.

Campbell, J. L. Geology and mineral resources of the James River valley, Va.; with map and geological sections. N.Y., *Putnam*, 1883. 119 p. 8°.

Charmes, Gabriel. Five months in Cairo and in Lower Egypt; transl. by W. Conn. London, *Bentley*, 1883. 356 p. 8°.

Crowe, A. H. Highways and byways in Japan: the experiences of two pedestrian tourists. London, *Low*, 1883. 318 p. 8°.

Duncan, J. Life of John Duncan, Scotch weaver and botanist; with sketches of his friends and notices of the times, by W. Jolly. London, *Paul*, 1883. 524 p., portr. 8°.

Grierson, J. B. Electric lighting by water-power. London, *Spons*, 1883. 8°.

Hinrichs, Gustavus. Notes on cloud forms and the climate of Iowa. Iowa City, 1883. (12) p. illustr., map. 8°.

Hoar, C. Mensuration made easy; or, the decimal system for the million. London, *Wilson*, 1883. 84 p. 8°.

Jackson, L. D'A. Hydraulic manual; consisting of working tables and explanatory text. Intended as a guide in hydraulic calculations and field operations. 4th ed. London, *Lockwood*, 1883. 496 p. 8°.

Lackowitz, W. Bilder aus dem vogel Leben Norddeutschland und seiner nachbarländer, nach skizzen von Paul M. Röper bearb. 1. ließ. Berlin, *Ehhardt*, 1883. 24 p. 1. 8° (to be completed in 25 parts).

Meigen, W. Die deutschen pflanzennamen Wesel. *Kühler*, 1882. 27 p. 8°.

Nature studies. By Grant Allen, Andrew Wilson, Thomas Foster, Edward Clodd, and Richard A. Proctor. London, *Wyman*, 1883 (Knowl. libr.). 322 p. 8°.

Nemontis, W. S. Darwin's evolution theory not supported by evidence. London, *Sampson*, 1883. 23 p.

Ohio meteorological bureau. Report for October, November, December. 3 nos. n.p., 1882. 16, 24, 34 p. 8°.—Circular of information, 9 p.

Perry, J. Practical mechanics. London, *Cassell*, 1883. 270 p. illust. 12°.

Proctor, R. A. The stars in their seasons; an easy guide to a knowledge of the stars, exhibiting, in twelve large maps, the appearance of the heavens at any hour of the night, all the year round. London, *Wyman*, 1883. 8°.

Rawlinson, G. Antiquity of man, historically considered. London, *Rel. tract. soc.*, 1883. 44 p. 8°.

Smith, G. Assyrian discoveries; an account of explorations and discoveries on the site of Nineveh, during 1873 and 1874. 7th ed. London, *Low*, 1883. 466 p. 8°.

Smith, G. The geography of British India, political and physical. London, *Murray*, 1883. 570 p., maps. 8°.

Wilkinson, H. Sunny lands and seas; a cruise around the world in the S. S. 'Ceylon.' London, *Murray*, 1883. 8°.

Williams, W. Matthieu. Sciences in short chapters. N.Y., *Funks & Wagstaff*, 1883. 308 p. 12°.

Year-book of pharmacy. 1882. London, *Churchill*, 1883. 607 p. 8°.